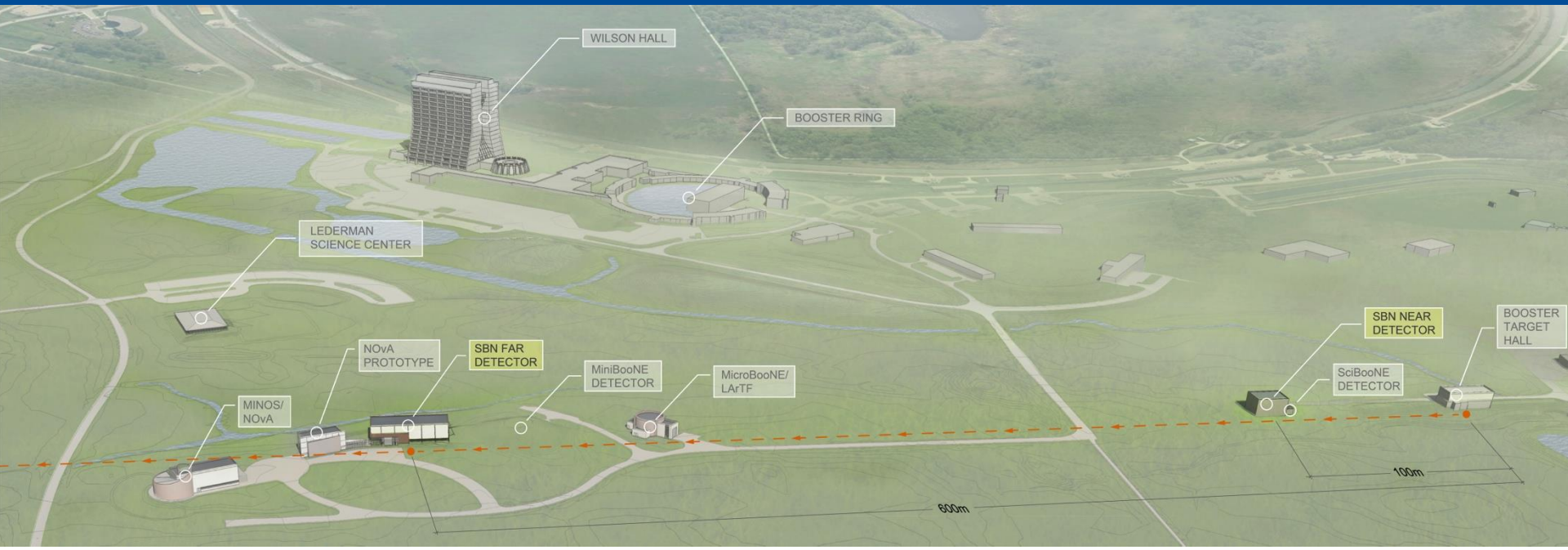
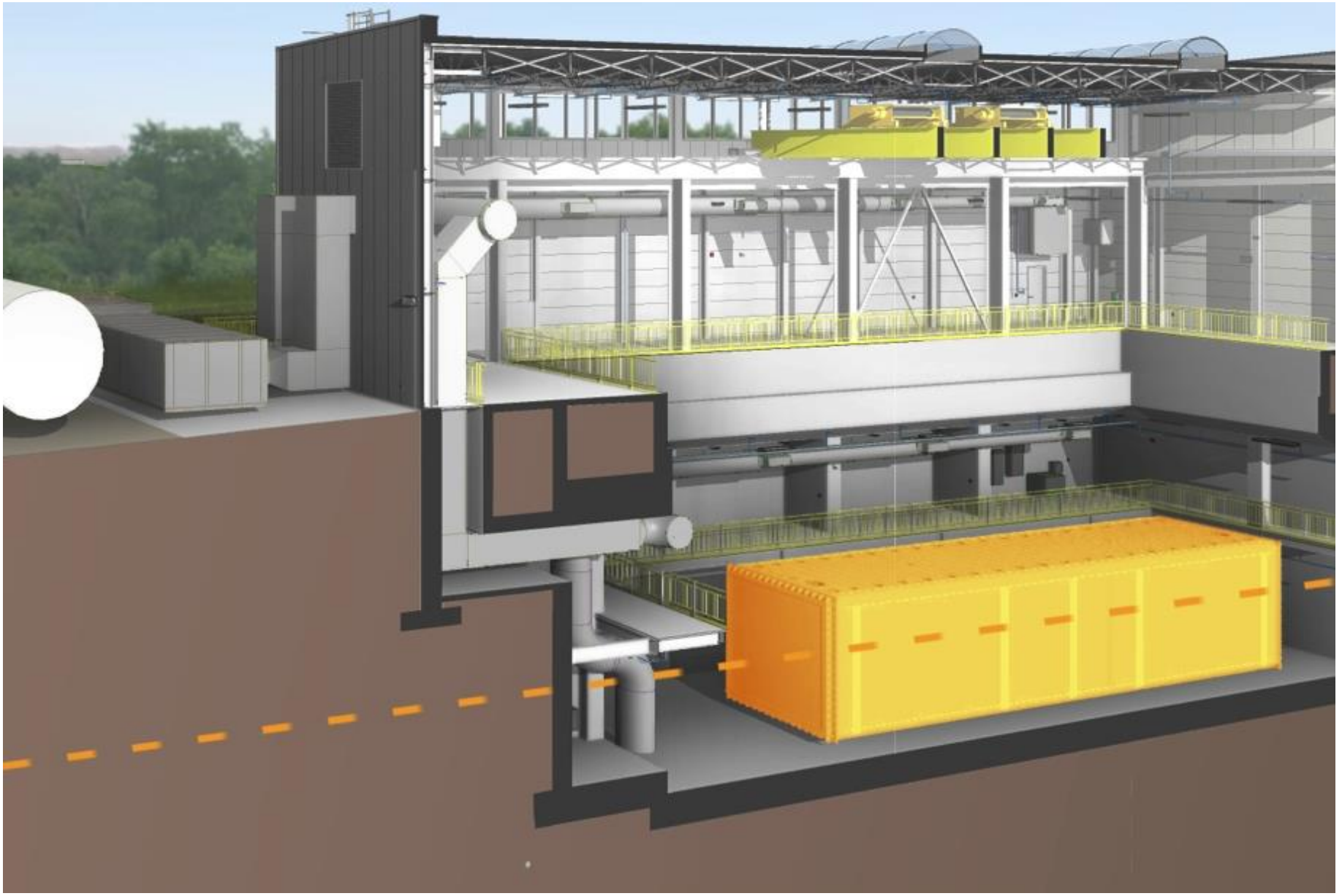


SBN Far Detector Installation & Integration

Fernanda G. Garcia, Steve Dixon, Andy Stefanik, Justin Tillman, John Voirin



Far Detector Installation & Integration Overview

- The SBN **F**ar **D**etector **I**nstallation and **I**ntegration (SBN FD I&I) work package aims to develop and implement the plan for installation and integration of the ICARUS detector at FNAL over the next two years and be ready for beam data taking in CY2017

- The recently formed SBN FD I&I team has been active getting information and establishing the strategy
  - Level 2 manager took up her post in Nov 2015
    - Visited CERN and met CERN and INFN collaborators
  - Experienced skill personnel identified - Nov 2015
  - Majority of the team is not at full-time capacity on the project
    - Nevertheless the group is motivated and committed to the task
  - At this point we have focused on
    - T600 detector installation plan
    - Integration CAD model
    - Grounding plan

Resources

WBS 4

Cat James

WBS 4.1.1

Fernanda G. Garcia

Mechanical Support -
Andy Stefanik

Justin Tilman , John Voirin

Jim Kilmer

Electrical Support -
Linda Bagby

Baghda Baiboussinov

Cryogenic -
Mike Geynisman

Mike Zuckerbrot

Alignment -
Babatunde OShinowo

Cosmic Ray Tagger -
Bob Wilson

David Warner

Collaboration with CERN and INFN colleagues is imperative throughout this process

Far Detector Installation & Integration Scope

The SBN far detector installation and integration work package scope includes the following major points:

- Assembly of one warm cryostat
- **Installation of T600 detector** (more later on this presentation)
- Overseeing / joint coordination of cryogenic system installation
  - assembly and testing
  - cooperation between CERN and FNAL
- T600 commissioning & cool-down
- Detector support systems
  - readout support requirements
  - grounding requirements (more later after this presentation)
- Installation of cosmic ray tracker (Detector breakout)
- Installation of overburden (Facility Infrastructure breakout)

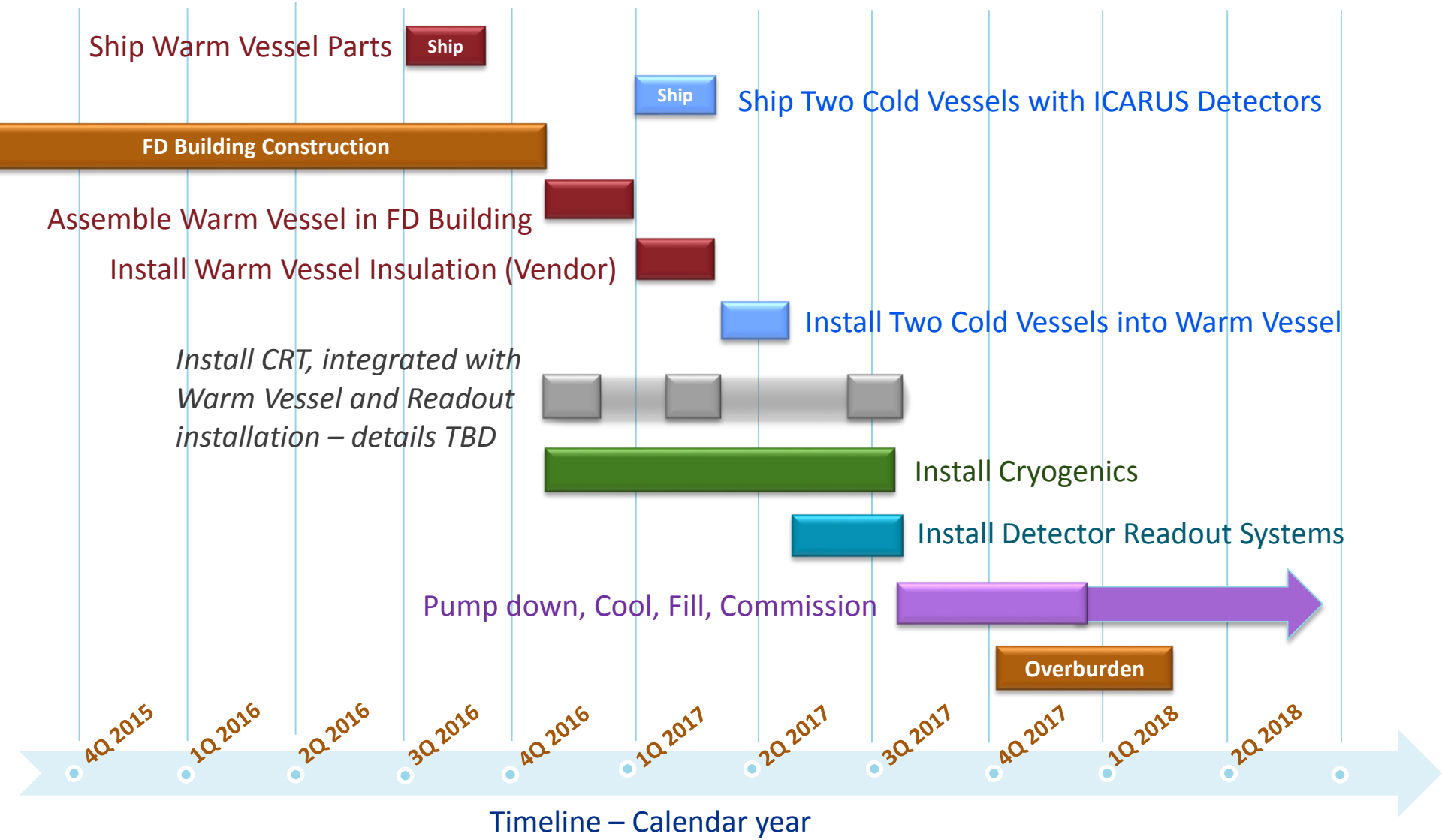
Firming up the high-level integration between the different subsystems is key to maintain schedule

Structuring the SBN Far Detector I&I task

WBS 40 SBN/4.1.1 – FD Installation and Integration

- Identify a *responsible* manager for each subsystem ✓
- Develop a *schedule*
  - Provisional schedule in progress ✓
  - "Living document" as our understanding matures
- Identify *budget* needs
  - First top-down (presented in this review) ✓
  - Updating to a bottom-up approach --> system managers define their budget in agreement with project leader
- Account for dependences on or links with other subsystems, schedule and budget
  - Level of granularity will depend on complexity of task
- Define the type and number of documents required for the project
- Define management and communication structure
  - Weekly meetings with managers ✓
  - Increase personnel recruitment in the next months

Far Detector Installation Timeline – Provisional Plan



Cooperation among institutions

- Active communication and close cooperation with CERN and INFN colleagues is essential
  - Maintain consensus and keep the collaboration informed
  - We will seek advice on alternatives to consider during the planning process
  - We are assuming some installation tasks will be collaborative with our colleagues
- We will rely on Claudio Montanari (ICARUS Technical Coordinator) and Marzio Nessi (Head of CERN Neutrino Platform) for our primary point of contact and anticipate a close collaboration with the entire team

Current thoughts on

Detector Grounding (presented later)
Installation of the T300 modules

Installation of the two T300 cold detectors

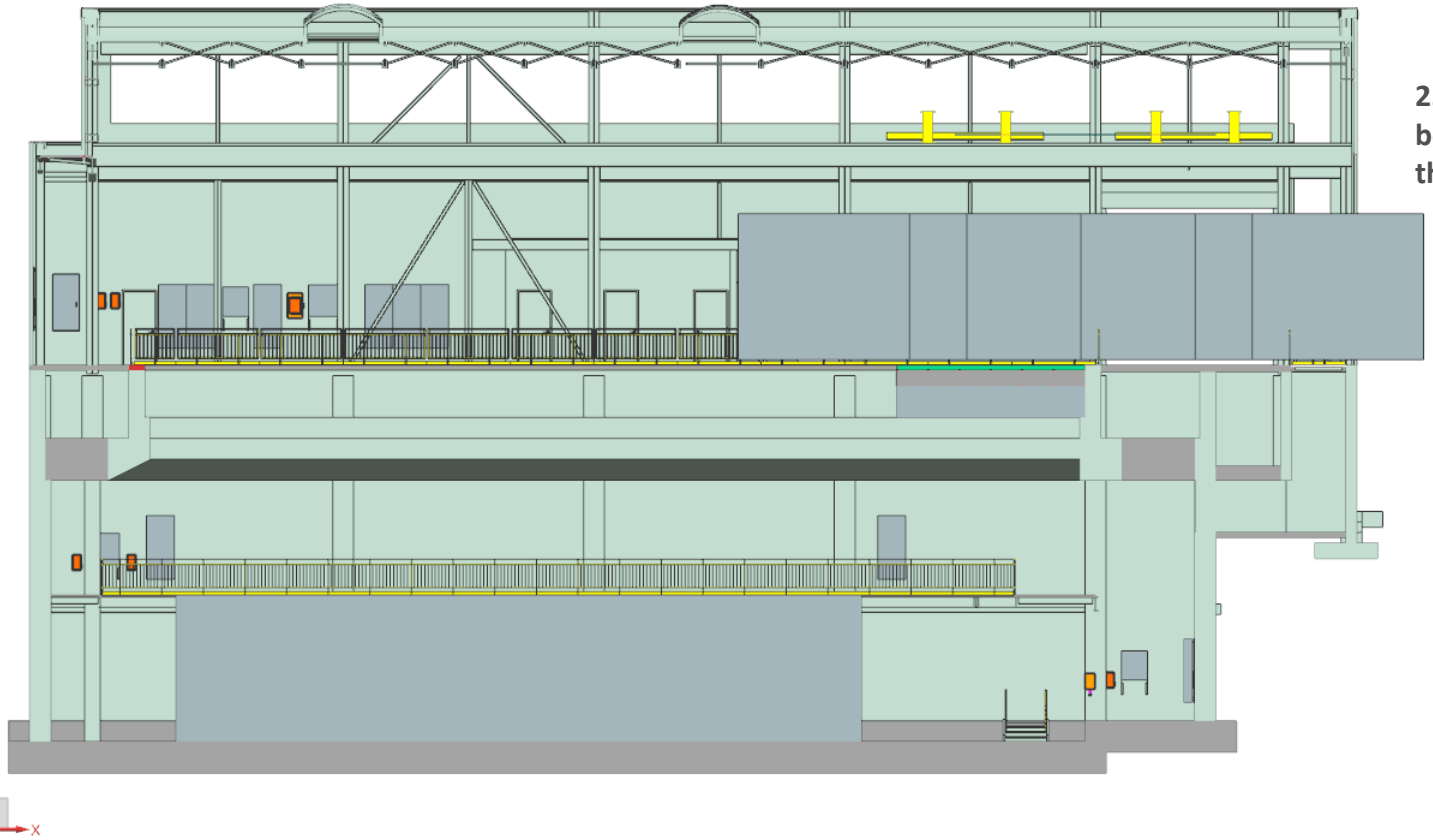
- The current installation proposal is based on the following:
  - Each unfilled T300 detector weights 52 metric tons (57 US short tons).
  - There are two building cranes; each crane has a capacity of 27.2 metric tons (30 US short tons).
  - We assume we will need a lifting fixture.
  - Fermilab personnel will install the T300s if no rigging contractors are required.
    - We have two other possibilities that depend on the equipment that Fermilab owns:
      - Use a rigging contractor for specific tasks.
      - Use a rigging contractor for the entire installation task.
  - We will work with Fermilab rigging and safety personnel as the installation plan develops. We have already started discussions with rigging personnel.
  - Installation will be in accordance with Fermilab Standards.

Installation of the two T300 cold detectors

- Each T300 will arrive at Fermilab on a low-boy trailer

Installation of the two T300 cold detectors

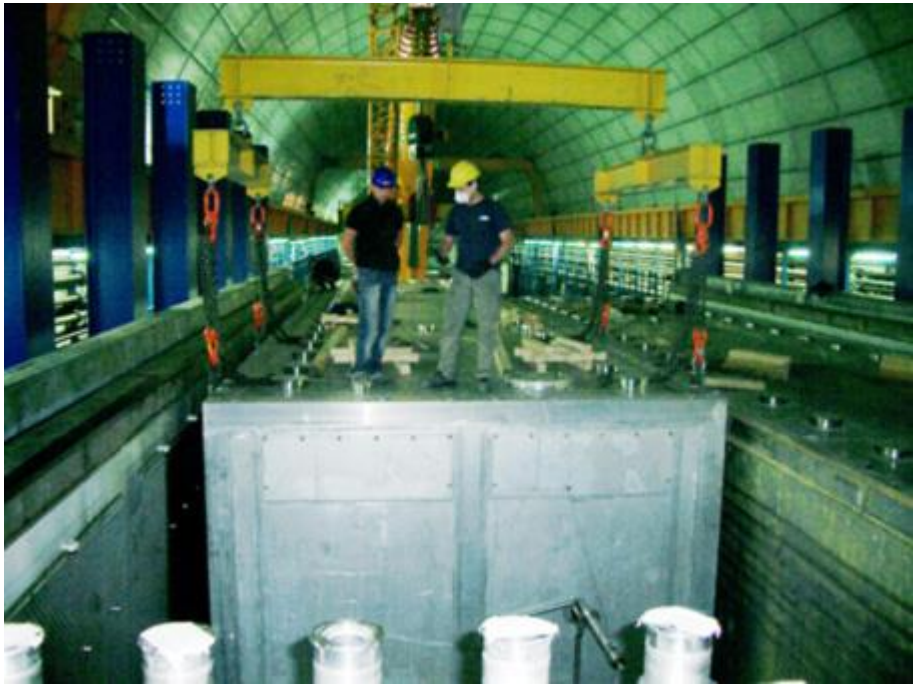
- Use rigging contractor to lift the T300 off the trailer and to place it on track rollers so it can be rolled into the building. Fermilab personnel does the rest of the installation work.



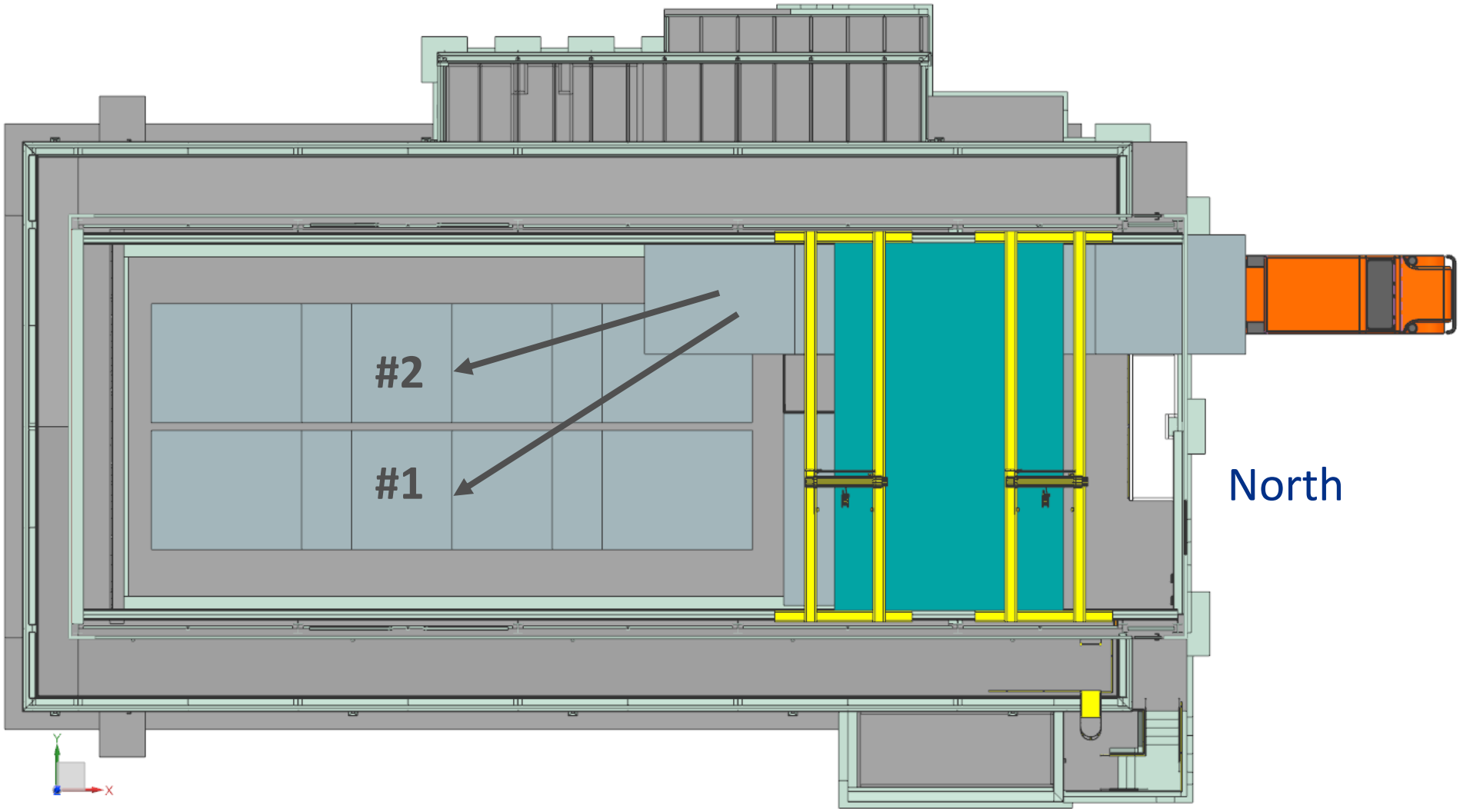
2.2 m (90”) clearance between the hook and the top of the T300.

T300 Lifting Fixture

- ICARUS lifting fixture.



T300 Installation Route



Installation of the two T300 cold detectors

- Next stage on the process is to work with CERN to
  - Obtain 3D models and drawings in a workable electronic format.
  - Verify weights and lift points on all the components that will reside in the far detector service building
    - Especially lift points for the T300 which will allow the lifting fixture to be designed
  - Determine which institution will provide the T300 lifting fixture for installation
  - Verify support points under the T300 modules so we know where to place the rollers
  - …

Conclusions

- SBN Far Detector installation and integration plans have started
  - Team recently formed to develop the plan
    - Personnel will increase as we continue working on this
  - Preliminary structure on management and communication is in place
  - Provisional schedule exists
    - Accumulating and updating information on tasks, schedule, and manpower as the team learn more about installation
  - Effort focus on the most urgent needs
    - Ongoing development of a plan for T600 detector installation
    - Preliminary thoughts on detector grounding